Contributing factors to risk emergence

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The International Risk Governance Council

- An independent private foundation
- Aims to support governments, business and other organisations
- Helps the understanding and management of global risks that impact on human health and safety, the environment, the economy and society at large by:
  - developing concepts of risk governance that have relevance across different risk types, problem areas, organisations and countries
  - anticipating major risk issues and improving the understanding and assessment of them and the ambiguities involved;
  - providing policy recommendations to key decision makers in government.

Risk Governance

- A holistic, comprehensive approach to risk identification, framing, assessment, management and communication
- Risk governance deficits: pinpointing at elements where processes often fail
- How to improve early anticipation of and early response to emerging risks
- Contributing factors to fertile grounds for risks to emerge, and be amplified/attenuated

Systemic risks

- Affect the functionality of systems
- May expand beyond their sector of origin
- Require collective action

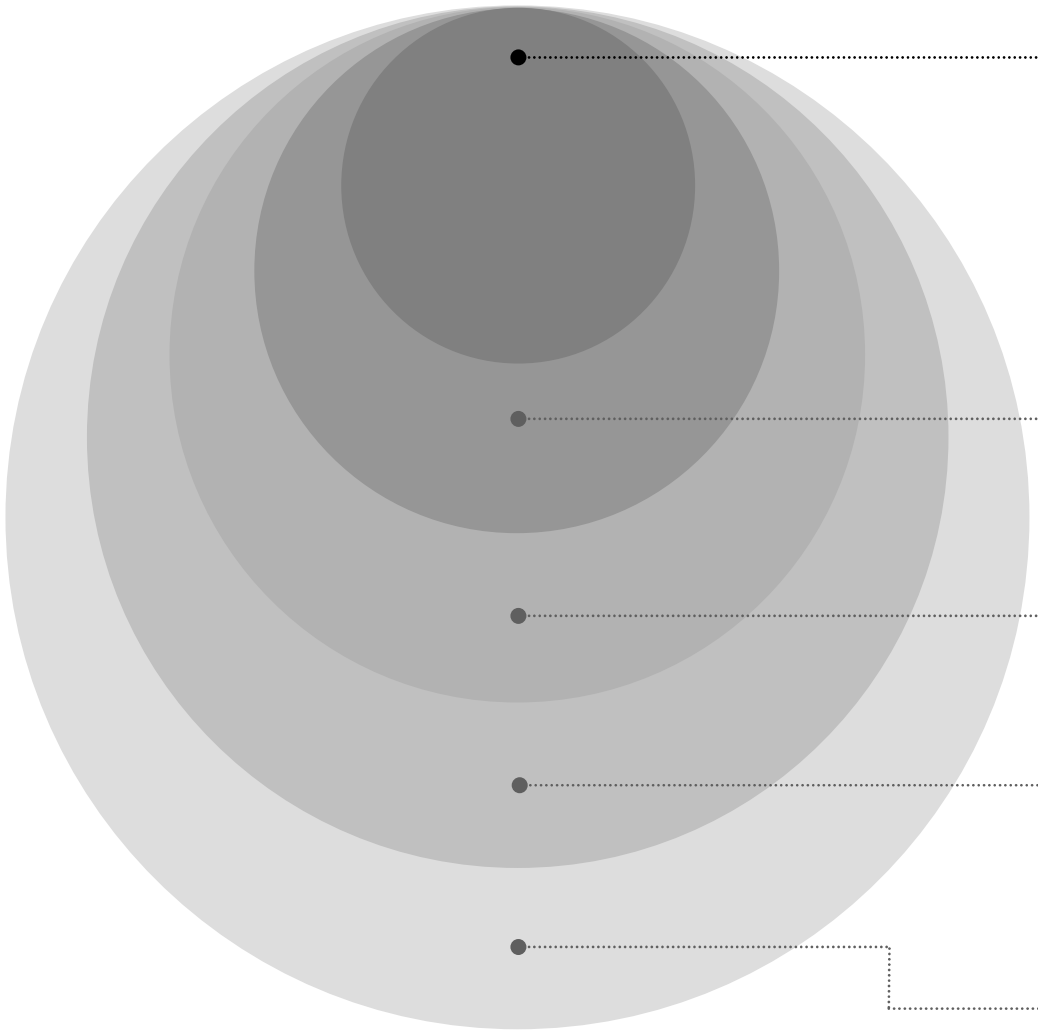
➢ For many emerging risks:
- need to adopt a systems perspective
- and to acknowledge the complexity of the system(s) of which they are part

Melamine tainted-milk (China, 2008)
An example of systemic food safety risk; the generic factor that contributed to its creation, amplification or attenuation could be relevant for a wide range of other potential food safety risks.

BSE
Technological advances, conflicts of interest, temporal complications, lack of transparency and adequate communication

GMO
Scientific unknowns, technological advances and conflicts of interest

Risk governance : the role of context



Core Risk Governance Process
- Risk assessment
- Risk evaluation
- Risk management
- Communication

Organisational Capacity
- assets
- skills
- capabilities

Actor Network
- politicians
- regulators
- industry/business
- NGOs
- media
- public at large

Political & Regulatory Culture
- different regulatory styles

Social Climate
- trust in regulatory institutions
- perceived authority of science
- degree of civil society involvement
- **RISK CULTURE**

Different types of emerging risks?

For example:

Known emerging risks

have been “spotted” on the horizon and are known to be risks,
e.g., obesity, counterfeit drugs, climate change, loss of biodiversity

Emerging issues

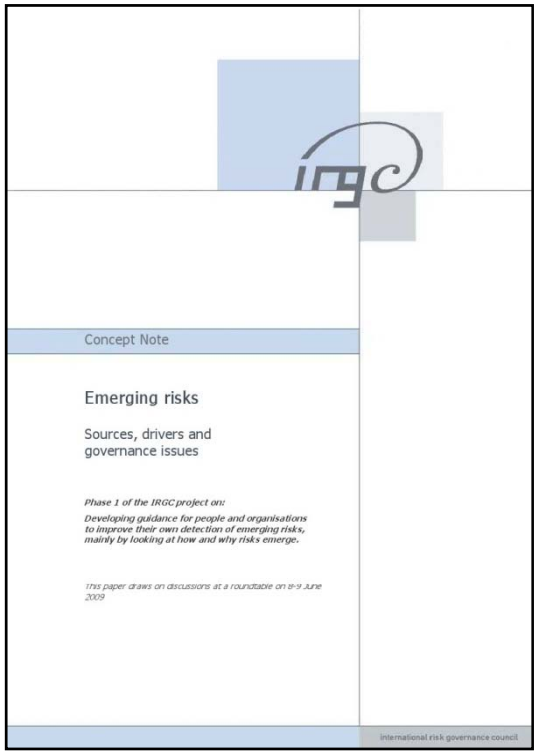
have been spotted on the horizon but we don’t know if they should be treated as risks, e.g., synthetic biology

Unknown risks

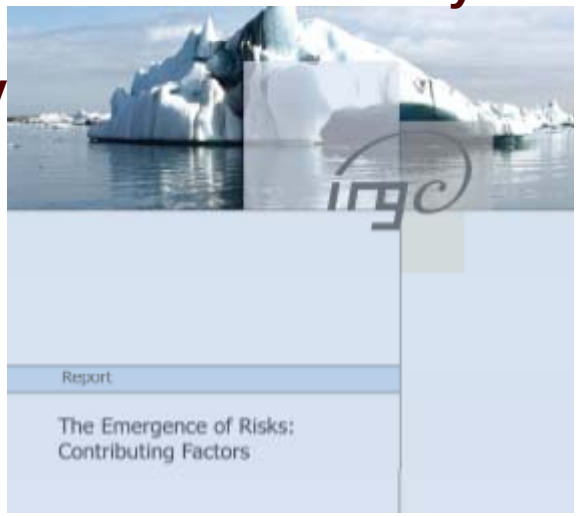
the need to anticipate the potential emergence of new issues or risks and, in a second step, to assess them in their emerging phase

Why risks emerge, how are they amplified / attenuated?

Sources, drivers and governance issues related to why risks emerge

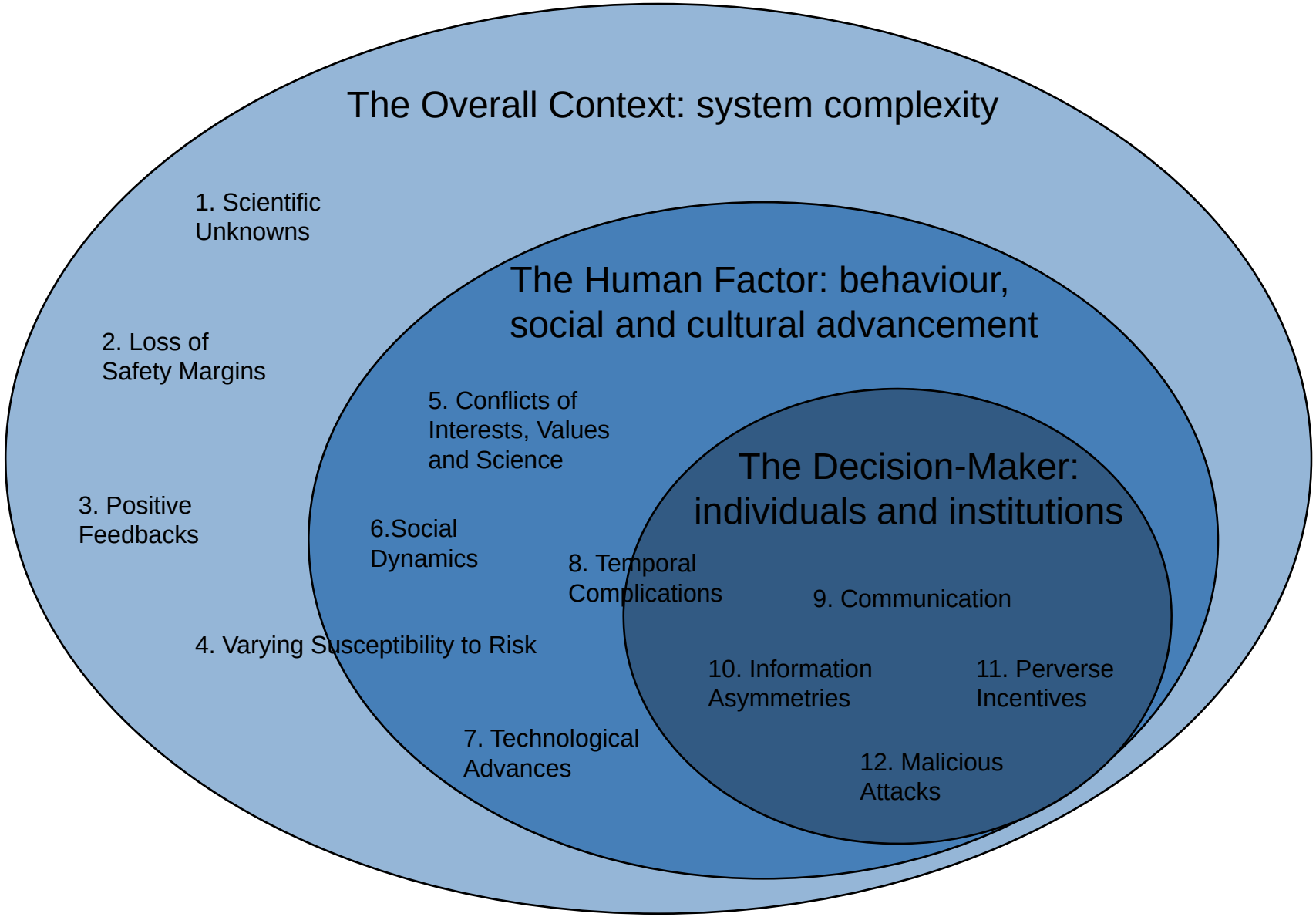


Contributing factors to 'fertile ground' from which risk may emerge



- **Adopting a systems perspective**
- **Acknowledging the role of complexity**

The Emergence of Risks: 12 Contributing Factors



Melamine tainted-milk (China, 2008)

Emergence of the risk:

Factor #11 Perverse incentives

> unintended secondary consequences of regulation (which imposed strict nutrition requirements on infant formula) created perverse incentives for producers to add melamine to milk

- **Perverse Incentives**

Inappropriate incentives may lead to the emergence of risks (either by fostering overly risk-prone behaviours or by discouraging risk prevention efforts).

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Amplification of the risk:

Factor #1: scientific unknowns

>at the time of the scandal, there was little existing toxicological information about melamine, especially in humans

>there was a prevalent belief in the industry at the time that melamine was essentially non-toxic, since it had been used for years as an additive in the animal-feed industry

- **Scientific Unknowns**

Tractable and intractable unknowns contribute to risks being unanticipated, unnoticed, and over- or under-estimated.

Examples: unknowns related to sea level rise and its consequences, Potential risks of some applications of synthetic biology

- **Susceptibility to risk**

The consequences of an emerging risk may be very different from one population to another. Geography, genetics, experience and wealth are just some of the possible contextual differences that create varying susceptibility to risk.

Examples: susceptibility to loss of life and property from earthquakes, Susceptibility of vulnerable populations

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Factors #7 and 6: technological advances and social dynamics

>Chemical processes are now routinely applied to foodstuffs and the use of food additives has greatly increased

>urbanisation, modernisation and the spread of prosperity have drastically changed the lifestyle of the majority of people so that populations are now much more *reliant* on these processed, packaged foods than they used to be.

- **Technological Advances**

Risk may emerge when technological change is not accompanied by scientific surveillance of the resulting public health, economic, ecological and societal impacts. Risks are further exacerbated when economic, policy or regulatory frameworks are insufficient, yet technological innovation may be unduly retarded if such frameworks are overly stringent.

Examples: BSE, GM foods

- **Social Dynamics**

Risk may emerge when social dynamics change at a pace where institutions are not capable of maintaining enough stability for society to function in a fair, equitable, effective, and efficient manner.

Examples: changing eating habits, obesity, natural resources stress,

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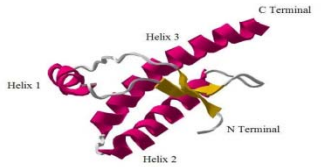
Factor #8 temporal complications > it took some time for the melamine contamination to be discovered, because harmful effects only became evident following a gradual build-up of melamine (due to chronic consumption)

- **Temporal Complications**

An emerging risk may be amplified
- if its time course makes detection difficult, or
- if the time course does not align with the time horizons of concern to risk assessors and managers.

Examples: asbestos, climate change, remuneration schemes, BSE, melamine-tainted milk

Bovine Spongiform Encephalopathy (BSE)



PrP prion wildtype structure

Emergence of the risk:

Factor #5: conflicts of interest

> The Ministry of Agriculture Fisheries and Food was responsible for protecting the economic interests of the agricultural community as well as dealing with matters related to food safety.

> UK political culture of “industry knows best” had led to very weak government regulation in, for example, the rendering industry

Photograph: Aijaz Rahi/AP

- **Conflicts about Interest, Values and Science**

Early risk management measures may be contested by interests who benefit from the emerging risk or who are threatened by risk identification and management. The opposing interests may contest the science or the values behind a risk management decision and public debates may not witness a clear separation between science, values and interests.

Examples: genetically modified crops in India (BT Brinjal), BSE, GM foods, Melamine-tainted milk

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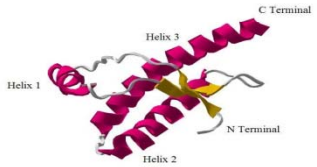

PrP prion wildtype structure

Emergence of the risk:

Factor #5: conflicts of interest

Factor #7: technological advances/change

> In the late 1970s there was a change in the production (rendering) process used to make meat and bone meal

> One hypothesis is that this change allowed for the survival of the infectious agent

Amplification of the risk

Factor #8: Temporal complications

> The disease has a long incubation period ranging from 30 months to eight years… this allowed it to emerge undetected and to spread

Factor#9 Communication

> Many uncertainties relating to the transmissibility of the disease were either down-played or ignored, resulting in an overstatement of certainty that British beef was completely safe to eat and that BSE was not transmissible to humans.

- **Communication**

The severity of the consequences of an emerging risk may be amplified when communication about it is not appropriate. Over-communicating as much as under-communicating can generate excessive or insufficient fear, respectively, which creates gaps in the management of the risk.

Example: BSE, financial crisis

New technologies, e.g.: genetically modified foods/ synthetic biology/ nanotechnology/

'Frankenfish'?

Potential risks to human health from:

- Allergens?
- Gene transfer?
- Outcrossing?

Emergence of the risk:

Factor #7: Technological advances

> Genetic engineering has changed the way that plant and animal traits can be selected for, creating uncertainties about potential risks to human and environmental health

Amplification of the risk:

Factor #5: Conflicts of science, interests and values

> Data collection and studies are most often done by industry…transparency? Completeness? Full disclosure?

Factor #1: Scientific unknowns

> In the case of human health in particular, most risks have not been proven… but can they be disproven?

Challenges …

- Guidelines for how organisations can improve their own anticipation of and early response to emerging issues
  - Address the uncertainty challenge
  - What is controllable, what is not controllable
  - Embrace risk taking and risk aversion
  - Adapt rules and regulations to new circumstances
  - Cultivate trust through communication
- There are obstacles to how organisations can actually improve their own anticipation of and early response to emerging risks

- Thank you

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